generating an entry comprising i) an identifier that identifies said at least one region, and ii) data characterizing a set of axes derived from a property distribution of said at least one region;

applying a mapping to the descriptor vector associated with said at least one region based on preselected criteria;

generating a key that corresponds to said mapping of the descriptor vector associated with said at least one region; and

B3 cont
storing said entry in a memory, wherein said key is associated with said entry such that the key indexes the entry for retrieval thereof..

2. (Cancelled) The method of claim 1, wherein said set of axes are invariant to rotation and translation of said at least one region.

3. (Cancelled) The method of claim 2, wherein said set of axes are derived from principal axes of said property distribution.

4. (Amended) The method of claim 1, wherein said property distribution of said at least one region is computed from a convolution with a probe function to a property field.

B4

5. (Amended) The method of claim 1, wherein said plurality of descriptor vectors are classified into groups, and wherein said mapping step maps said descriptor vectors to a space discriminating between said groups of descriptor vectors.

6. The method of claim 5, wherein said mapping is derived from the steps of:

generating first data representing differences between said groups of descriptor vectors;

generating second data representing variations within said groups of descriptor vectors;

identifying a set of component vectors that maximizes an F distributed criterion function, said criterion function having a numerator based upon said first data and a denominator based upon said second data;

generating an F distributed statistic for subsets of said component vectors, said statistic having a numerator based upon said first data and a denominator based upon said second data;

for each particular subset of component vectors, calculating a probability value for the F-distributed statistic associated with the particular subset;

selecting a probability value from probability values for said subsets of component vectors based upon a predetermined criterion;

identifying the subset of said component vectors associated with the selected probability value; and

generating a mapping to a space corresponding to the subset of component vectors associated with the selected probability value, and storing the mapping for subsequent processing.

7. The method of claim 6, wherein said first data comprises a matrix ε_b representing covariance between said groups of descriptor vectors, and said second data comprises a matrix ε_w representing covariance within said groups of descriptor vectors.

8. The method of claim 7, wherein said criterion function has the general form:

$$f(\hat{w}) = C\left(\frac{\hat{w}^T \varepsilon_b \hat{w}}{\hat{w}^T \varepsilon_w \hat{w}}\right)$$

where $\hat{w}$ is some vector, and C is a constant based upon degrees of freedom in ε_b and ε_w.

9. The method of claim 8, wherein C is determined as follows:

$$C = \frac{1/\text{degrees of freedom in } \varepsilon_b}{1/\text{degrees of freedom in } \varepsilon_w} = \frac{1/(N-1)}{1/(\sum n_i - N)}$$

where N represents the number of groups of descriptor vectors, n_i represents the number of regions, and $\sum n_i$ represents the sum of n_i for the N groups.

10. The method of claim 7, wherein the step of identifying a set of component vectors that maximizes an F distributed criterion function comprises the substeps of:

determining a set of (eigenvalue, eigenvector) pairs for the matrix ε_w

determining said set of component vectors based upon said set of (eigenvalue, eigenvector) pairs for the matrix ε_w.

11. The method of claim 10, wherein said statistic for a given subset of component vectors is based upon value of said criterion function for said subset of component vectors.

12. The method of claim 11, wherein said statistic for a given subset of component vectors has the following form:

$$\psi_S = C\left(\frac{1}{L_S}\right) \sum f_k$$

where f_k represents the value of the criterion function at a component vector in the given subset,
C is a constant,
L_S represents the number of f_k values in the given subset of component vectors, and
the Σ operation sums over the L_S f_k values in the given subset of component vectors.

13. The method of claim 12, wherein said a probability value for a particular F-distributed statistic represents a probability value that the particular F-distributed statistic could have been larger by chance.

14. The method of claim 13, wherein said probability value selected from probability values for said subsets of component vectors is a minimum probability value of said probability values for said subsets of component vectors.

15. The method of claim 6, wherein said mapping for said at least one descriptor vector performs a loop over each component vector belonging to the subset of component vectors associated with the selected probability;

wherein, in each iteration of said loop, dot product of said descriptor vector with a transpose of a unit vector for the given component vector is added to a running sum.

REMARKS

Claims 1-15 are pending in this application. All the claims were rejected in the Office Action dated August 8, 2002 (hereafter, the Office Action). Claims 1, 4, and 5 have been amended. Claims 2 and 3 have been cancelled. Applicants respectfully request reconsideration in consideration of the following remarks.

I. PRIORITY

The Office Action states that "Applicant has not complied with one or more conditions for obtaining the benefits of 35 U.S.C. § 119(e) on grounds that the parent application and the present application fail to comply with the requirement of the first paragraph of 35 U.S.C. § 112. Applicants respectfully point out that the cited law contains several requirements including enablement, written description and best mode disclosure and requests a more specific statement of the alleged shortcomings of both specifications.

II. CLAIM REJECTIONS UNDER 35 U.S.C. § 101